

REMARKS/DISCUSSION OF ISSUES

By this Amendment, Applicants amend claims 8, 12, 15 and 18 to correct minor typographical errors.

Accordingly, claims 1-18 remain pending in the application.

Please reconsider and reexamine this application in view of the following Remarks.

CLAIM OBJECTIONS

Applicants respectfully submit that by this Amendment to claims 8, 12 and 15, the claim objections have been overcome. Accordingly, Applicants respectfully request that the claim objections be withdrawn

35 U.S.C. § 102

The Office Action rejects: claims 1-14 and 16-17 under 35 U.S.C. § 102(b) over Jiang et al. U.S. Patent Publication 2002/0027527 ("Jiang"); and claims 1, 15-16 and 18 under 35 U.S.C. § 102(e) over Suganthan et al. U.S. Patent 6,791,506.

Applicants respectfully traverse all of these rejections for at least the following reasons.

I. Claims 1-14 and 16-17 Are All Patentable over Jiang

Claim 1

Among other things, in the antenna of claim 1 each of two resonant printed wiring structures includes: (1) a first printed wire on an end face of a dielectric substrate extending from a first side face of the dielectric substrate to a second side face of the dielectric substrate along one of the edges of the end face; (2) a second printed wire disposed on the end face in parallel to and spaced apart from the first printed wire, and also extending from the first side face to the second side face; and (3) a third printed wire disposed on the end face extending between the first printed wire and the second printed wire perpendicularly to the first and second printed wires to connect the first printed wire to the second printed wire.

Applicants respectfully submit that Jiang does not disclose an antenna

including the recited first and second printed wiring structures as defined above. In particular, Jiang's printed wiring structures at least do not include the first printed wire extending from a first side face of the dielectric substrate to a second side face of the dielectric substrate along one of the edges of the end face; and also do not include the second printed wire parallel to and spaced apart from the first printed wire, and also extending from the first side face to the second side face.

The Office Action cites element 7a in FIG. 1 of Jiang as supposedly corresponding to the recited first printed wire, and elements "5a and 5c" as supposedly corresponding to the recited second printed wire.

Applicants respectfully disagree.

From inspection of FIG. 1 of Jiang, it is plainly apparent that element 7a does not extend from a first side face of the dielectric substrate 9 to a second side face of the dielectric substrate 9. Furthermore, element 7a is not disposed along one of the edges of the end face. So, element 7a cannot correspond to the recited first printed wire. Additionally, elements 5a and 5c are very clearly two physically separated strips and are specifically identified as such by Jiang (see e.g., paragraph [0023], line 3). So "elements 5a and 5c" cannot possibly correspond to the recited "second printed wire" (singular). Finally, neither element 5a nor element 5c nor any "combination" thereof also extends from the first side face to the second side face. So they cannot correspond to the recited second printed wire.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 1 is patentable over Jiang.

Claims 2-4 and 12-14

Claims 2-4 and 12-14 depend from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1, and for the following additional reasons.

Claim 13

Claim 13 is drawn to a printed wiring board on which an antenna as defined in claim 1 – including its dielectric substrate – is mounted.

The Office Action cites FIG. 2 of Jiang as supposedly disclosing the claimed

printed wiring board, citing element 11 as supposedly corresponding to the claimed printed wiring board.

However, Applicants respectfully submit that it is plainly evident from FIG. 2 of Jiang that there is no antenna that includes a dielectric substrate mounted on printed circuit board (PCB) 11 of FIG. 2 of Jiang. Indeed, the Office Action completely fails to identify any element in FIG. 2 of Jiang as even supposedly corresponding to the dielectric substrate of an antenna mounted on PCB 11.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 13 is patentable over Jiang.

Claim 14

Claim 14 is drawn to a radio communication device for the GPS, DCS/PCS, UMTS and Bluetooth domain, including an antenna as claimed in claim 1.

The Office Action cites paragraph [0003] of Jiang as supposedly disclosing a radio communication device for the GPS, DCS/PCS, UMTS and Bluetooth domain.

However, Applicants respectfully submit that paragraph [0003] does not make any mention of a radio communication device for the GPS, DCS/PCS, UMTS and Bluetooth domain.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 14 is patentable over Jiang.

Claim 5

Among other things, in the antenna of claim 5 each of two resonant printed wiring structures includes: (1) a first printed wire that stretches out from a first side face of a dielectric substrate to a second side face of the dielectric substrate along one of the edges of the end face; (2) a second printed wire that stretches out from the second printed wire to the first printed wire; and (3) a third printed wire connected to the first printed wire.

Applicants respectfully submit that Jiang does not disclose an antenna including the recited first and second printed wiring structures as defined above. In particular, Jiang's printed wiring structures at least do not include the first printed wire that stretches out from a first side face of a dielectric substrate to a second

side face of the dielectric substrate along one of the edges of an end face; and also do not include the second printed wire that stretches out from the second end face to the first end face.

The Office Action cites element 107 in FIG. 1 of Jiang as supposedly corresponding to the recited first printed wiring structure, and element 108 as supposedly corresponding to the recited second printed wiring structure. The Office Action also cites element 7a as supposedly corresponding to the recited first printed wire, and element 108 as supposedly corresponding to the recited second printed wire.

Applicants respectfully disagree.

At the outset, Applicants respectfully submit that element 108 cannot possibly correspond to both the second printed wiring structure and the second printed wire of either of the first or second printed wiring structures, as alleged in the Office Action.

Also, from inspection of FIG. 1 of Jiang, it is plainly apparent that element 7a does not stretch out from a first side face of the dielectric substrate 9 to a second side face of the dielectric substrate 9. Furthermore, element 7a is not disposed along one of the edges of an end face. So, element 7a cannot correspond to the recited first printed wire. Additionally element 108 does not stretch out from the second end face to the first end face. So it cannot correspond to the recited second printed wire.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 5 is patentable over Jiang.

Claims 6-11

Claims 6-11 depend from claim 5 and are deemed patentable for at least the reasons set forth above with respect to claim 5, and for the following additional reasons.

Claim 10

Among other things, in the antenna of claim 10, the fourth printed wire runs along an edge of the first end face.

The Office Action cites element 6c of Jiang as supposedly corresponding to the recited fourth printed wire.

However, Applicants respectfully submit that it is plainly evident from FIG. 1 of Jiang that element 6c does not run along an edge of the first end face.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 10 is patentable over Jiang.

Claim 16

Among other things, the printed circuit board assembly of claim 16 includes: (1) a printed circuit board; and (2) an antenna mounted on the printed circuit board, the antenna including a dielectric substrate having two larger end faces and four smaller end faces.

Applicants respectfully submit that Jiang does not disclose any such printed circuit board assembly.

The Office Action cites PCB 11 of FIG. 2 as supposedly corresponding to the printed circuit board of claim 16, and cites element 9 of FIG. 1 as supposedly corresponding to the dielectric substrate of claim 16.

Applicants respectfully disagree.

At the outset, Jiang very clearly discloses that FIG. 1 shows one embodiment of an antenna (including element 9), and FIG. 2 shows a completely separate embodiment of an antenna (including PCB 11). Jiang does not disclose any PCB assembly that includes both element 9 and PCB 11. More specifically, Jiang does not disclose any PCB assembly that includes element 9 mounted on element 11 – or any other antenna including a dielectric substrate mounted on a PCB.

So Jiang cannot possibly disclose the printed circuit board assembly of claim 16.

Furthermore, the printed circuit board assembly of claim 16 includes an antenna, where the antenna includes two resonant printed wiring structures, each including: (1) a first printed wire on an end face of a dielectric substrate extending from a first side face of the dielectric substrate to a second side face of the dielectric substrate along one of the edges of the end face; (2) a second printed wire disposed

on the end face in parallel to and spaced apart from the first printed wire, and also extending from the first side face to the second side face; and (3) a third printed wire disposed on the end face extending between the first printed wire and the second printed wire perpendicularly to the first and second printed wires to connect the first printed wire to the second printed wire.

As explained above with respect to claim 1, Applicants respectfully submit that Jiang does not disclose an antenna including the first and second printed wiring structures each including the recited first and second wires.

Accordingly, for at least these reasons, claim 16 is deemed patentable over Jiang.

Claim 17

Claim 17 depends from claim 16 and is deemed patentable over Jiang for at least the reasons set forth above with respect to claim 16, and for the following additional reasons.

Among other things, in the printed circuit board assembly of claim 17, the first and second printed wiring structures of the antenna comprise silver paste.

Applicants respectfully submit that Jiang does not disclose such a feature.

The Office Action states that Jiang's printed wiring structures "inherently" comprise silver paste.

Applicants respectfully disagree.

M.P.E.P. § 2112 (IV) provides that:

EXAMINER MUST PROVIDE RATIONALE OR EVIDENCE TENDING TO SHOW INHERENCY. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.

In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ

323, 326 (CCPA 1981). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’ ” In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

(emphasis added)

Here, the Examiner has not provided any rationale or evidence tending to show inherency. Indeed, Jiang very specifically discloses that its antenna comprises “thin copper sheets bonded to respective surfaces of a dielectric material” (paragraph [0020] at lines 3-6).

Therefore, it is not possible for Jiang to disclose the printed circuit board assembly of claim 17.

Furthermore, in the printed circuit board assembly of claim 17, the antenna is mounted on the printed circuit board such that the end face of the antenna on which are disposed the first and second printed wiring structures is disposed directly on and immediately adjacent to the printed wiring board.

The Office Action states – without any explanation whatsoever - that such a feature is shown in FIGs. 1 and 2. Applicants respectfully disagree.

Accordingly, for at least these reasons, claim 17 is deemed patentable over Jiang.

II. Claims 1, 15-16 and 18 Are All Patentable over Suganthan

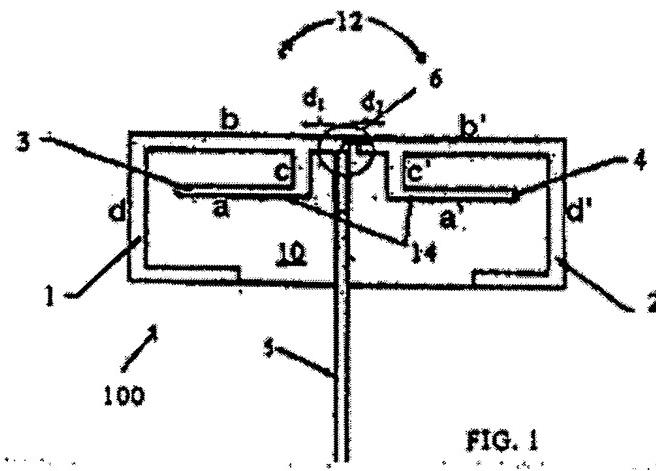
Claim 1

Among other things, in the antenna of claim 1 each of two resonant printed wiring structures includes: (1) a first printed wire on an end face of a dielectric substrate extending from a first side face of the dielectric substrate to a second side

face of the dielectric substrate along one of the edges of the end face; (2) a second printed wire disposed on the end face in parallel to and spaced apart from the first printed wire, and also extending from the first side face to the second side face; and (3) a third printed wire disposed on the end face extending between the first printed wire and the second printed wire perpendicularly to the first and second printed wires to connect the first printed wire to the second printed wire.

Applicants respectfully submit that Suganthan does not disclose an antenna including the recited first and second printed wiring structures as defined above. In particular, Suganthan's printed wiring structures at least do not include the combination of the first printed wire extending from a first side face of the dielectric substrate to a second side face of the dielectric substrate along one of the edges of the end face; and the second printed wire parallel to and spaced apart from the first printed wire, and also extending from the first side face to the second side face.

The Office Action provides FIG. 1 below as a marked-up version of FIG. 1 of Suganthan wherein the Examiner identifies certain portions of antenna 100 with letters a-d and a'-d'.



Referring to FIG. 1 above, the Office Action states that element a supposedly

corresponds to the recited first printed wire, and element *b* supposedly corresponds to the recited second printed wire.

Applicants respectfully disagree.

From inspection of FIG. 1 above, it is plainly apparent that element *a* does not extend from a first side face of the substrate 10 to a second side face of the dielectric substrate 10. Furthermore, element *a* is not disposed along one of the edges of the end face. So, element *a* cannot correspond to the recited first printed wire. Additionally, element *b* does not extend from the first side face to the second side face. So it cannot correspond to the recited second printed wire.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 1 is patentable over Suganthan.

Claim 15

Claim 15 depends from claim 1 and is deemed patentable over Suganthan for at least the reasons set forth above with respect to claim 1.

Claim 16

Among other things, the printed circuit board assembly of claim 16 includes: (1) a printed circuit board; and (2) an antenna mounted on the printed circuit board, the antenna including a dielectric substrate having two larger end faces and four smaller end faces.

Applicants respectfully submit that Suganthan does not disclose any such printed circuit board assembly.

The Office Action states that:

With respect to claim 16, Suganthan discloses in figure 1 below a printed circuit board assembly comprising a printed circuit board (the printed circuit board built on the substrate [10]), and an antenna (100) mounted on the printed circuit board, the antenna including a dielectric substrate (10) having two larger end faces (one top face and one bottom face) and four smaller end faces (four side faces of left, right, front, and back side faces of the antenna [100]) and two resonant printed wiring structures ([a-d] and .

However, the Office Action does not identify anything in FIG.1 as supposedly corresponding to "*the printed circuit board built on the substrate [10]*" nor does it cite anything in Suganthan as supposedly disclosing such a printed circuit board built on substrate 10.

Applicants respectfully submit that the only "printed circuit board" disclosed by Suganthan in FIG. 1 is the antenna itself which includes the substrate 10, and that there is no printed circuit board on which the antenna including substrate 10 is mounted.

So Suganthan cannot possibly disclose the printed circuit board assembly of claim 16.

Furthermore, the printed circuit board assembly of claim 16 includes an antenna, where the antenna includes two resonant printed wiring structures, each including: (1) a first printed wire on an end face of a dielectric substrate extending from a first side face of the dielectric substrate to a second side face of the dielectric substrate along one of the edges of the end face; (2) a second printed wire disposed on the end face in parallel to and spaced apart from the first printed wire, and also extending from the first side face to the second side face; and (3) a third printed wire disposed on the end face extending between the first printed wire and the second printed wire perpendicularly to the first and second printed wires to connect the first printed wire to the second printed wire.

As explained above with respect to claim 1, Applicants respectfully submit that Suganthan does not disclose an antenna including the first and second printed wiring structures each including the recited first and second wires.

Accordingly, for at least these reasons, claim 16 is deemed patentable over Suganthan.

Claim 18

Claim 18 depends from claim 16 and is deemed patentable over Suganthan for at least the reasons set forth above with respect to claim 16.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 1-18 and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (571) 283.0720 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment (except for the issue fee) to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

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